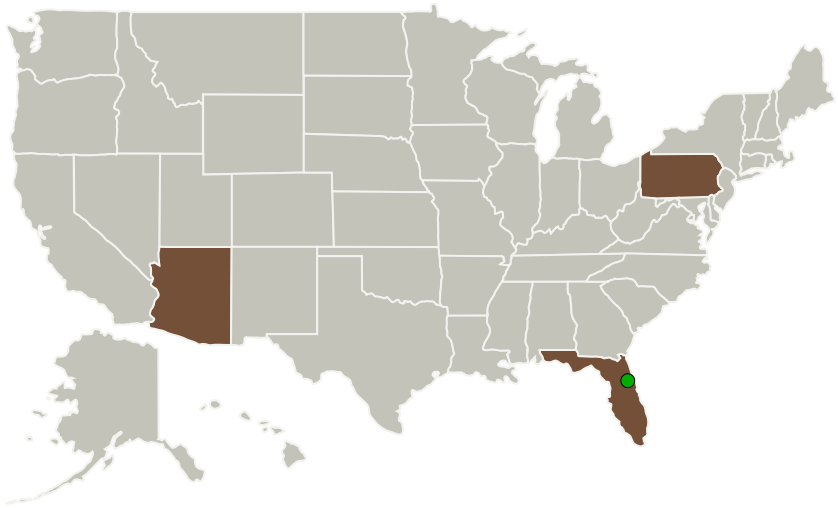
Ultra High Temperature Refractory Materials, Phase I

Completed Technology Project (2013 - 2014)

Project Introduction

Legacy refractory materials that have origins dating to the original Saturn program are commonly used in current launch facilities. Although they failure to meet the target requirements, they are the only approved material. Our research team proposed to develop an ultra high temperature refractory system that uses a non-cement binder, a high temperature macro aggregate, and reactive nano aggregates. The developed binder system will exhibit substantial improvements in strength and have functional limit of 4000F.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Advanced Ceramics Manufacturing	Lead Organization	Industry Small Disadvantaged Business (SDB)	Tucson, Arizona
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida
Villanova University	Supporting Organization	Academia	Villanova, Pennsylvania

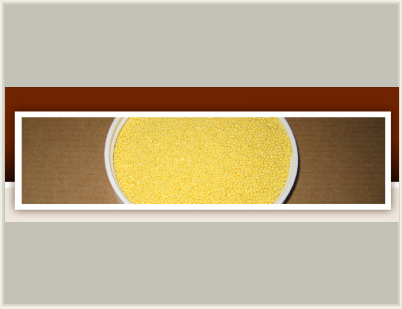


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Table of Contents

Ultra High Temperature Refractory Materials, Phase I

Completed Technology Project (2013 - 2014)

Primary U.S. Work Locations	
Arizona	Florida
Pennsylvania	

Project Transitions

May 2013: Project Start

May 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138589)*

Images

Project Image
Ultra High Temperature Refractory Materials
(https://techport.nasa.gov/image/132581)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Ceramics Manufacturing

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

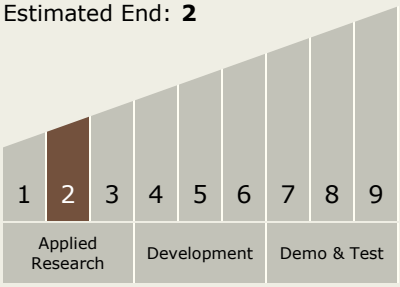
Carlos Torrez

Principal Investigator:

Zachary Wing

Technology Maturity (TRL)

Current: **2**
Estimated End: **2**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.1 Aeroassist and Atmospheric Entry
    - TX09.1.1 Thermal Protection Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System